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ARP Management Configuration



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Comments and questions about how the ... system software works are welcomed. Please review the FAQ in the related manual, and if your question is not covered, send email by using the following web page:

<http://www.raisecom.com/en/xcontactus/contactus.htm>.

If you have comments on the ... specification, instead of the web page above, please send comments to:

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Release Notes

Date of Release	Manual Version	Software Version	Revisions

Preface

About This Manual

This manual introduces primary functions of the configuration management software for RC series products.

Who Should Read This Manual

This manual is a valuable reference for sales and marketing staff, after service staff and telecommunication network designers. For those who want to have an overview of the features, applications, structure and specifications of ... device, this is also a recommended document.

Relevant Manuals

《Raisecom NView System User Manual》

《Raisecom Nview System Installation and Deployment Manual》

《... User Manual》

《... Commands Notebook》

Organization

This manual is an introduction of the main functions of ... EMS. To have a quick grasp of the using of the EMS of ... , please read this manual carefully. The manual is composed of the following chapters

Chapter 1 Overview

This chapter briefly introduces the basic function of ...

Chapter 2 Configuration Management

This chapter mainly introduces the central site configuration management function of the

Chapter 3 Performance Management

This chapter focuses on performance management function of

Chapter 4 Device Maintenance Management

This chapter introduces the device maintenance management function of

Appendix A Alarm Type

The alarm types supported by

Compliance

The RC series products developed by Raisecom are strictly complied with the following standards as well as ITU-T, IEEE, IETF and related standards from other international telecommunication standard organizations:

YD/T900-1997 SDH Equipment Technical Requirements - Clock

YD/T973-1998 SDH 155Mb/s and 622Mb/s Technical conditions of optical transmitter module and receiver module

YD/T1017-1999 Network node interface for the Synchronous Digital Hierarchy (SDH)

YD/T1022-1999 Requirement of synchronous digital hierarchy (SDH) equipment function

YD/T1078-2000 SDH Transmission Network Technique Requirements-Interworking of Network Protection Architectures

YD/T1111.1-2001 Technical Requirements of SDH Optical Transmitter/Optical Receiver Modules—2.488320 Gb/s Optical Receiver Modules

YD/T1111.2- 2001 Technical Requirements of SHD Optical Transmitter/Optical Receiver Modules—2.488320 Gb/s Optical Transmitter Modules

YD/T1179- 2002 Technical Specification of Ethernet over SDH

G.703 Physical/electrical characteristics of hierarchical digital interfaces

G.704 Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels

G.707 Network node interface for the synchronous digital hierarchy (SDH)

G.774 Synchronous digital hierarchy (SDH) - Management information model for the network element view

G.781 Synchronization layer functions

G.783 Characteristics of synchronous digital hierarchy (SDH) equipment functional blocks

G.784 Synchronous digital hierarchy (SDH) management

G.803 Architecture of transport networks based on the synchronous digital hierarchy (SDH)

G.813 Timing characteristics of SDH equipment slave clocks (SEC)

G.823 The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy

G.825 The control of jitter and wander within digital networks which are based on the synchronous digital hierarchy (SDH)

G.826 End-to-end error performance parameters and objectives for international, constant bit-rate digital paths and connections

G.828 Error performance parameters and objectives for international, constant bit-rate synchronous digital paths

G.829 Error performance events for SDH multiplex and regenerator sections

G.831 Management capabilities of transport networks based on the synchronous digital hierarchy (SDH)

G.841 Types and characteristics of SDH network protection architectures

G.842 Interworking of SDH network protection architectures

G.957 Optical interfaces for equipments and systems relating to the synchronous digital hierarchy

G.691 Optical interfaces for single channel STM-64 and other SDH systems with optical amplifiers

G.664 Optical safety procedures and requirements for optical transport systems

I.731 ATM Types and general characteristics of ATM equipment

I.732 ATM Functional characteristics of ATM equipment

IEEE 802.1Q Virtual Local Area Networks (LANs)

IEEE 802.1p Traffic Class Expediting and Dynamic Multicast Filtering

IEEE 802.3 CSMA/CD Access Method and Physical Layer Instruction

Chapter 1 ARP Management Configuration

This chapter is mainly about how to configure and maintain ARP on the switch, including:

- ✧ ARP interview
- ✧ ARP configuration
- ✧ Monitoring and maintenance
- ✧ Typical configuration example

1.1 ARP principle interview

When the switch software system is transmitting IP message, it is needed to look for its physical address according to the requirement so that the message can be sent to destination host. The mapping relationship of IP address and MAC address is kept in ARP address mapping table.

ARP address mapping table includes 2 types of MAC addresses:

- ✧ Dynamic learned MAC address: Dynamic MAC addresses learned through ARP protocol and will be aged if not used.
- ✧ Static MAC address: added manually to the table and do not age.

If host A sends IP packets to host B, host A uses the IP address of host B and searches corresponding MAC address in its own ARP table. If there is the MAC address of host B, host A will send the IP packet directly; if there is not the MAC address of host B, host A will send ARP request, get the MAC address of host B and add the address to the ARP table.

In most of the cases, when host A sends IP packets to host B, it is pretty possible that host B will sent packets to host A again, so host B will also need to send ARP request to host A. In order to reduce the traffic in the network, host A write its own MAC address in the ARP request. When host B receives the ARP request, it will record the MAC address of host A to its mapping table. Then it is more convenient for host B to communicate host A.

In some special situation, administrator also can configure ARP address mapping table manually.

1.2 ARP configuration

This part is about how to configure and maintain ARP on the switch, including:

- ✧ Default ARP configuration
- ✧ Adding stable ARP address table item
- ✧ Deleting ARP address mapping table item
- ✧ Configuring ARP dynamic address mapping table item overtime
- ✧ Configuring ARP dynamic learning mode
- ✧ Clearing ARP address mapping table

1.2.1 Default ARP configuration

Function	Default value
Stable ARP address table item	No
APR dynamic address mapping table item overtime	1200s
ARP dynamic learning mode	learn-reply-only

1.2.2 Adding dynamic ARP address table item

Usually, ARP mapping table is maintained by dynamic ARP protocol, ARP will search the resolution from IP address to MAC address according to the protocol, needing not the participation of administrator. Only when it is needed to add stable ARP table item will the ARP manual configuration commands be used to ARP mapping table.

Stable ARP address table item has the features below:

- ✧ Stable ARP address table item has to be added and deleted manually
- ✧ Stable ARP address will not grow old

The configuration steps are as follows:

Step	Command	Description
1	config	Enter global configuration mode
2	arp <i>ip-address mac-address</i>	Add a stable table item to ARP address mapping table
3	exit	Quit global configuration mode and enter privileged EXEC mode
4	show arp	Show all the table units in ARP address mapping table

△ Notice:

- The IP address that is stable added to ARP table item must belongs to the IP network segment that the switch's three-layer port belongs to

Use global configuration command **no arp** *ip-address* to delete stable ARP table item.

1.2.3 Configure the overtime of ARP dynamic address table item

User can configure the existing time of ARP dynamic item, ARP dynamic table that exceeds the time will be deleted.

The configuration steps are as follows:

Step	Command	Description
------	---------	-------------

1	config	Enter global configuration mode
2	arp aging-time sec	Configure the existing time of ARP dynamic table item, ARP dynamic table item that exceeds the time will be deleted
3	exit	Quit global configuration mode and enter privileged EXEC mode
4	show arp	Show all the table items of ARP address mapping table

△ Notice:

- If the exceeding time is set to 0, ARP dynamic table item will no longer grow old.

Use global configuration command **no arp aging-time** to restore the default configuration of ARP dynamic address mapping table item exceeding time.

1.2.4 Configure ARP dynamic learning mode

It is mentioned above that, to reduce the network communication capacity, when host A is sending its ARP request group, it will write the mapping from its own IP address to the physical address into ARP request group. When host B receives the ARP request group from host A, host B will write the address mapping of host A into its own mapping table. This makes the process of host B sending data to host A more convenient. Configure ARP dynamic learning mode to realize the process mentioned above for learn-all.

The intention of configuring ARP dynamic learning mode is to prevent ARP attack from happening. When configured **learn-all** mode, the host will learn both ARP request message and response message; when configured **learn-reply-only** mode, it will learn ARP response message only, and responds ARP response messages only for request message, without learning ARP.

Step	Command	Description
1	config	Enter global configuration mode
2	arp mode { learn-all learn-reply-only }	Configure ARP dynamic learning mode
3	exit	Quit global configuration mode and enter privileged EXEC mode
4	show arp	Show all the table items in ARP address mapping table

1.2.5 Clearing ARP address mapping table

In some situations, network administrator may need to clear all the ARP table items. Use command **clear arp** to realize it.

The configuration steps are as follows:

Step	Command	Description
1	config	Enter global configuration mode
2	clear arp	Clear all the table items in ARP address mapping table
3	exit	Quit global configuration mode and enter privileged EXEC mode
4	show arp	Show all the table items in ARP address mapping table

1.3 Monitoring and maintenance

Use command **show arp** to show the commands of all the table items in the ARP address mapping table, including: the IP address of each table item, MAC address and table item type.

Command	Description
show arp	Show all the table items in ARP address mapping table

1.4 Typical configuration example

1) Network request:

- ✧ Configure the aging time of the switch dynamic ARP table item to 600s.
- ✧ To prevent ARP attack in some situations, configure the switch's dynamic ARP learning mode to **learn-reply-only**.
- ✧ Under the premise that IP port address is configured, add a stable ARP table item.

2) Configuration steps:

```
Raisecom(config)# arp aging-time 600
Raisecom(config)# arp mode learn-reply-only
Raisecom(config)# arp 10.0.0.1 0050.8d4b.fd1e
```




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